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Running head: Activity and Well-being

A longitudinal study of well-being in older workers and retirees: The role of engaging in different type of activities

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Full title: A longitudinal study of well-being in older workers and retirees: The role of engaging in different types of activities

Abstract

This study examines the impact of engaging in seven types of activities on depression and quality of life in retirees and older workers over a period of two years, using a sample from the Survey of Health, Ageing and Retirement in Europe (SHARE). Longitudinal data was available from 2,813 retirees and 1,372 older employees. Our results showed that volunteering, providing help, and going to sports or social clubs at the baseline improved retirees' quality of life over a period of two years. No direct effects of engaging in activities were found for older employees. Moreover, higher depression at the baseline fostered the depression experience at the follow up in those retirees and older employees who were caring for disabled adults at baseline. In retirees with higher depression at baseline, participation in religious organizations was associated with a greater decrease in depression at follow-up than in those who had lower levels of depression at baseline. For older employees, taking part in political or community organizations at baseline was related to a greater decrease in depression at follow up than in those employees who experienced higher initial depression.

Keywords: activity, depression, quality of life, retirees, older workers

Practitioner points:

- Practitioners should make attempts to reduce physical demands and time pressure exerted over older employees to improve their well-being over time.
- Practitioners should design intervention programs and preventive measures that focus on how to stimulate retirees' and older employees' engagement in community and leisure activities to achieve successful aging.

A longitudinal study of well-being in older workers and retirees: The role of engaging in different types of activities

The population in many industrialized countries is increasingly greying (United Nations, 2007). Thus, the issue of successful aging has been receiving an increasing attention for a long time. In this context, examining how engaging in different activities impacts psychological well-being and quality of life in old age has been a major research interest. Following activity theory (Havighurst, 1963), studies have shown a positive relationship between overall activity level and well-being (e.g., Fernandez-Ballesteros, Zamarron, & Ruiz, 2001; Silverstein & Parker, 2002). However, these effects do not necessarily apply to all activities and all groups. For instance, Warr, Butcher, and Robertson (2004a) have argued that the groups of retirees and older employees are characterized by specific features, such as different employment roles, which might condition the effects of engaging in particular activities on psychological well-being. However, this assumption still remains underinvestigated.

Moreover, the vast majority of past research has analysed activities that can be evaluated as positive, paying less attention to those that might be stressful, such as caregiving (Warr et al, 2004a). In addition, previous studies have usually focused on either one of these types of activities, and to the best of our knowledge hardly any studies have examined both types simultaneously (for exceptions see, Burr, Mutchler, & Caro, 2007; Menec, 2003; Wahrendorf & Siegrist, 2010). Wharendorf and Siegriest (2010) found that volunteering was associated with lower probability of experiencing a decrease in quality of life, while no effects were observed for caregiving. Menec (2003) reported positive relationships between social and productive activities and happiness, function, and mortality, respectively, while solitary activities were related only to happiness.

Finally, the lack of longitudinal studies prevents us from drawing any firm conclusions regarding how engaging in different activities changes well-being over time (Hao, 2008; Lampinen, Heikkinen, Kauppinen, & Heikkinen, 2006; McAuley, Blissmer, Marquez, Jerome, Kramer, & Katula, 2000; McAuley et al., 2005).

Considering these arguments we contribute to the existing body of literature in different ways. First, we examine the impact of engaging in both, desired (e.g. going to sports/social clubs) as well as potentially stressful activities (e.g. caring for disabled) on depression and quality of life over a two-year period in retirees and older employees. Second, by predicting quality of life, our study aims at expanding the analysis of psychological well-being outcomes beyond the traditional and most frequently examined mental health indicator of depression. According to Wiggins, Netuveli, Hyde, Higgs, and Blane (2008) quality of life in old age refers to the ability to participate in the society and to feel joy and pleasure associated with it. Quality of life is an important well-being indicator that is not completely covered by the presence or absence of illness (McAuley et al., 2000; Wiggins et al., 2008) and therefore deserves explicit attention. Third, we use a longitudinal design that allows us to examine if the assumed benefits of engagement in activities differs for persons with higher versus lower levels of initial well-being. Previous research that has highlighted the role of activities in enhancing individual well-being (e.g., Hecht & Boies, 2009; Mojza, Sonnentag, & Bornemann, 2011) has not yet addressed the role of initial well-being in the relationship between activities and well-being over time. Thus, the value of active lifestyle for those who are initially most vulnerable remains unclear. This is an important omission because we need to know for whom engagement in activities is most beneficial. Our findings will help design interventions that stimulate elderly's active participation in society.

Activity theory discussed the role of engaging in different activities for well-being in old age (Havighurst, 1963). This framework proposed that social and psychological needs of older adults, such as preference and needs for activities are continuous across the adult life span. According to activity theory, it is important that the elderly population maintains activities of middle-aged adults in order to achieve successful aging and to protect its well-being. Warr, Butcher, Robertson, and Callinan (2004b) define subjective well-being in terms of pleasant and the absence of unpleasant affective and cognitive states, such as for instance happiness, pleasure, satisfaction and low depression. Previous studies have linked active lifestyle to reduced mortality risk (Glass, Mendes de Leon, Marottoli, & Berkman, 1999), reduced risk of cognitive impairment (Wang, Karp, Winblad, & Fratiglioni, 2002), greater life satisfaction and positive affect (Nimrod, 2007), lower stress (Patterson, 1996), and reduced depression levels (Herzog, Markus, Franks, & Holmberg, 1998).

There are several mechanisms that relate activities to better well-being. Firstly, carrying out an activity often implies the achievement of personal goals and offers channels for sustaining a positive self-concept, self-validation and a sense of competence, all of which are essential aspects of well-being (Warr et al., 2004a). Secondly, having an active lifestyle might give older adults an opportunity to socialize, to meet other people with similar interests, and to maintain personal relationships with friends and families (McAuley et al., 2000; Poon & Fung, 2008). Third, engaging in activities beyond employment fulfils the need for time structure and generativity (Griffin & Hesketh, 2008). Finally, engaging in physical activities, such as exercising, improves cardiovascular health and strength and reduces chronic disease risk factors which are detrimental for health and well-being (Jenkins, Pienta, & Horgas, 2002). All these mechanisms are in accordance with the conservation of resources theory which argues that individuals strive to obtain and maintain resources to protect their well-being and avoid negative outcomes, such as depression (Hobfoll, 2001). This perspective is

also supported in social identity theory which argues that membership in social groups, such as family, sport or religious groups provides individuals with a sense of purpose and belonging (i.e. social identity) which in turn positively impacts their well-being (Haslam, Jetten, Postmes, & Haslam, 2009).

Nevertheless, not all activities older adults engage in have positive effects on well-being. Past research has argued that activities that are associated with a sense of burden, stress, anxiety, and/or loneliness (such as caring for disabled) may hamper physical and psychological health (e.g., Choi, Burr, Mutchler, & Caro, 2007). In line with conservation of resources theory (Hobfoll, 2001), caregiving can be argued to be an activity that reduces rather than enhances resources because it is most frequently a solitary activity which involves a large amount of caregivers' effort and time leading to fewer resources to invest in other roles (Zacher, Jimmieson, & Winter, 2012). We argue that it is important to take into account different types of activities within the same study in order to explore what role each of them plays in achieving better well-being.

In the present study we examine how engaging in seven activities at the baseline relates to depression and quality of life two years later. These activities are: (1) volunteering, (2) providing help to neighbours, friends or family members, (3) taking part in political or community organizations, (4) attending educational courses, (5) going to the sports/social clubs, (6) taking part in religious organizations, and (7) caregiving for disabled/sick adults. We explored these activities because previous research showed they are potentially valued by older population and cover both productive and social components of active lifestyle (Burr et al., 2007; Warr et al., 2004a). Past research has found positive health-related outcomes from volunteering, such as fewer symptoms of anxiety, better personal control, higher life satisfaction, lower mortality, enhanced self-esteem, mastery experience, and improved psychological well-being (Harlow & Cantor, 1996; Herzog et al., 1998; Mojza et al., 2011;

Thoits & Hewitt, 2001). In a similar vein, previous research found that carrying out community service, such as helping friends, neighbours or the wider community, was associated with life satisfaction (Harlow & Cantor, 1996). Moreover, engaging in active leisure activities, such as attending educational courses or going to sport/social clubs was frequently related to health benefits (Biddle, 2000; McAuley et al., 2000; Taylor et al., 2004). Past research has also reported beneficial effects of religious activities for health and well-being among older adults (Musick, Blazer, & Hays, 2000; Schaie, Krause, & Booth, 2004). Therefore, in the present study we expect that:

Hypothesis 1a: Volunteering, providing help to neighbours, friends or family members, taking part in political or community organizations, attending educational courses, going to the sports/social clubs, and taking part in religious organizations are negatively related to depression and positively to quality of life over time.

In contrast to these activities, caregiving for sick or disabled individuals represents a unique form of activity because it usually involves a significant commitment of caregiver's time and effort on a daily basis. Moreover, unlike volunteering or informal help to family or friends, caregiving often takes place within the recipient's home, out of public view. Finally, caregiving is often viewed as a form of obligatory activity, especially if care is provided to a close relative (Burr et al., 2007). Therefore, this type of caring has been considered as inherently stressful experience that might be detrimental to well-being (Choi et al., 2007; Pinquart & Sörensen, 2003). Although some studies identified boundary conditions that buffer the negative effects of caregiving on individual outcomes (e.g., Zacher et al., 2012), the majority of past research has reported that caregivers experienced a decline in health and an increase in at-risk health behaviours and increased levels of loneliness and depression (Choi et al., 2007; Pinquart & Sörensen, 2003). Following this reasoning, we predict that:

Hypothesis 1b: Caregiving for a sick or disabled adult is positively related to depression and negatively to quality of life over time.

The Moderating Role of the Initial Level of Depression and Quality of Life

So far, we have argued that engaging in different types of activities directly relates to well-being. In addition, we expect that the degree to which activity engagement is related to well-being is not uniform for all elderly adults. Particularly, the initial levels of depression and quality of life might condition the effects of engagement in different activities on depression and quality of life at the follow-up.

Conservation of resources theory suggests that "resources gains become more important in response to loss circumstances" (Hobfoll, 2001, p. 346). Based on this framework, individuals with higher resource loss (manifested in higher depression at the baseline) who invest resources (by engaging in positive activities) are expected to be significantly more positively impacted by this resource gain compared to those who did not experience loss (manifested in lower depression at the baseline). This suggestion has been examined in Barefoot et al. (2000) who argued that social support is most effective in those who are most vulnerable. Moreover, depression is characterized by loss of energy, meaning that depressed individuals need to muster more effort to engage in active lifestyle. Thus, we expect that individuals suffering from higher initial levels of depression and who nevertheless succeed in engaging in positive activities will show a larger decrease of depression two years later compared to those with lower levels of depression at baseline. Similarly, we expect that individuals who had lower quality of life at baseline and engaged in positive activities will show a greater improvement in their quality of life two years later compared to those with higher levels of quality of life at baseline. In contrast, caring for disabled adult as a more stressful activity should have detrimental effects because, as argued previously, it depletes resources further. Thus, we expect that those individuals who suffer from higher levels of

depression at baseline and who are providing care worsen their depression symptoms two years later the most. In the same way, we assume that lower initial quality of life strengthens the negative association between caregiving and quality of life at the follow up. Therefore, we expect that:

Hypothesis 2a: The negative relations between volunteering, providing help to neighbours, friends or family members, taking part in political or community organizations, attending educational courses, going to the sports/social clubs and taking part in religious organizations on the one hand, and depression and low quality of life at follow up on the other, will be stronger for individuals with a higher level of depression and a lower level of quality of life at baseline.

Hypothesis 2b: The positive relations between caring for a sick or disabled adult and depression and low quality of life at follow up will be stronger for persons with a higher level of depression and a lower level of quality of life at baseline.

We test our hypotheses in two samples, in retirees and older employees, separately. Few previous studies, addressing the effects of activities on well-being, have distinguished between retirees and elderly employees (Warr et al., 2004a). This is an important omission since each stage of advanced age is characterized by unique features. First, retirement represents the end of professional activities and the beginning of a new phase of life involving new projects and plans. Second, older employees are still actively engaging in paid work activities and hence have less free time than retirees to engage in activities outside work. Moreover, such extra-work activities might be less important for them. Thus, engaging in extra-work activities might be more relevant for retirees because they cannot derive enjoyment form work activity anymore (Harlow & Cantor, 1996). In this line, Warr et al. (2004a) found that going to church and doing charity work was related to affective well-being in retirees, but not in older employees.

Method

Sample and Procedure

The data used in this study was taken from Waves 1 and 2 of the SHARE project. SHARE (Survey of Health, Ageing and Retirement in Europe) is a large cross-national research project exploring topics related to working conditions, health and well-being, and socioeconomic status among people aged 50 and older from Austria, Belgium, Czech Republic, France, Germany, Greece, Denmark, Ireland, Israel, Italy, The Netherlands, Poland, Spain, Sweden, and Switzerland (Siegrist, Wahrendorf, Von dem Knesebeck, Jürges, & Börsch-Supan, 2006). In the current study, we did not use data from Ireland, Israel, Czech Republic, and Poland because the data from only one wave was available from these countries at the time of data analysis. The first wave was conducted in 2004 and included 29,876 participants (Kapteyn, 2008). In each participating country probability samples were drawn. The data were obtained via face-to-face interviews. Two years later, the same participants were revisited and interviewed (see Börsch-Supan et al., 2008 for a detailed sample and methodology description).

The whole longitudinal sample was composed of 18,741 participants (SHARE release 1.0.0). For the purposes of this study, we included individuals aged 50 or above who were working or were retired in Wave 1 and continued working or being retired in Wave 2. Applying this principle, we were left with a total of 12,116 individuals in two sub-samples: a sample of retirees (retired in both waves) and a sample of older employees (working in both waves). The status of being “retired” and “employed” was determined on the basis of participants’ self-assessment of their current situation. Only 4.5% of the retirees indicated they nevertheless did some paid work. The mean number of contracted hours per week in the sub-sample of employees was 34.44 (SD = 9.04). Because we selected only those individuals who were either employed or retired at both Waves, the sample used for this study may not be

representative of the 50+ European population. Furthermore, we also excluded all cases with missing data which additionally reduced our samples and could imply the sample attrition effects. We addressed this possibility by examining the differences between those who were included and those excluded from the analyses in terms of the studied variables in each group. We did not find significant differences between those included and those excluded from the analyses in most of the studied variables, including the initial depression or quality of life. The only significant differences in older employees were observed in terms of age, gender, marital status and country of origin, whereas in retirees, significant differences were observed in terms of age, level of education, and country of origin. Hence, sample attrition was not widely present in this study.

The final sample of retirees comprised 2,813 individuals (43.9% female). Average age was 69.79 years, with a range of 50 to 99 (*SD* = 7.61). Retirees had a mean of 9.92 (*SD* = 4.43) years of education. Moreover, 71.8% of retired participants were living with a spouse. The final sample of employees consisted of 1,372 participants (45.1% female). Average age was 55.01 years, with a range of 50 to 80 (*SD* = 3.84). Employees had a mean of 12.28 (*SD* = 3.61) years of education. In this group, 80.6% of participants were living with a spouse.

Measures

Engaging in activities. Participants were asked to indicate which of the following activities they had done in the last month: (1) *voluntary or charity work*, (2) *caring for a sick or disabled adult*, (3) *provided help to family, friends or neighbours*, (4) *attended an educational or training course*, (5) *gone to a sport, social or other kind of club*, (6) *taken part in a religious organization* (church, synagogue, mosque etc.), and (7) *taken part in a political or community-related organization*. Engaging in each of these activities in Wave 1 was coded as a dummy variable, with “Yes”=1 and “No” = 0.

Depression. A short form of the Center for Epidemiologic Studies Depression (CES-D) scale was used to measure depressive symptoms. This is a widely used instrument in general population surveys (Siegrist et al., 2006). In Wave 1, the SHARE questionnaire included eleven items from the original 20-item version (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993). Participants were asked to reply to each item, using a 4-point Likert scale (1 = almost all of the time, 4 = almost none of the time). The items were reversed so that higher scores indicated higher depression. In Wave 2, eight of the eleven items were included in the SHARE questionnaire. Participants indicated whether they were suffering from eight depressive symptoms with "Yes" and "No". Afterwards, affirmative replies were summed to indicate an index of depressive symptoms (scores ranging from 0 – complete absence of depressive symptoms to 8 – the presence of all symptoms). We recoded the mean frequency of depressive symptoms from Wave 1 to be a more comparable indicator of Wave 2 depression index in two ways (the value 4 as "Yes" and the rest as "No" and the values 4 and 3 as "Yes" and the rest as "No"). However, we used the mean frequency score of depressive symptoms of the 8 items that were also used in Wave 2 (Cronbach's α = .80 on both sub-samples) because this indicator had the highest correlation with the Wave 2 depression index.

Quality of life. Quality of life was measured with the CASP-12 questionnaire (Higgs, Hyde, Wiggins, & Blane, 2003; Siegrist et al., 2006). This measure is based on a concept of subjective well-being following Diener's (1994) three key criteria: (1) It is subjective (residing in the experience of the individual); (2) It does not capture only the absence of negative factors, but also includes positive experience; and (3) The instrument covers a global rather than only a narrow assessment of one life domain (Wiggins et al., 2008). Specifically, items of the CASP-12 cover four areas that are particularly relevant in later life: control, autonomy, self-realization, and pleasure. Participants indicated how often each item applies to them, using a 4-point Likert scale (1 = often, 4 = never). We recoded the original scores so

that higher values represent higher quality of life. The reliability (Cronbach's α) for the sample of retirees was .82 in Wave 1 and .81 in Wave 2. In the sample of employees, the reliability (Cronbach's α) was .80 in Wave 1 and .76 in Wave 2.

Control Variables

Apart from depression and quality of life at baseline, we controlled for various demographic variables and number of limitations in activities of daily living because past research indicated that age, gender, socio-economic status, health, and marital status, and limitations with carrying out daily activities are factors that may confound and modify the associations between activities and subjective well-being (Choi et al., 2007; Cummings, 2002; Everard, 1999; Warr et al., 2004a). Moreover, we controlled for the country of origin/residence to partial out the effects of country-level confounders, such as different retirement systems or GDP. In the retirees subsample we also included the variable *paid work* because this aspect could influence retirees' psychological well-being. In the analysis of the employee sample, we introduced work stressors as additional control variables in order to partial out the effects of working conditions in the relationships between activities and well-being (De Lange, Taris, Kompier, Houtman, & Bongers, 2003; Grebner, Semmer, & Elfering, 2005).

Demographic information. Participants reported demographic information, including *age, marital status, gender, education, and financial status*. Their country of residence was indicated by the interviewers. Specifically, age was measured in years; marital status was coded as (1) for those living with a partner/spouse and (0) for single; gender was coded as (1) for male and (0) for female; the level of education was measured in terms of years of education; and financial status was measured as amount of money in bank account (in Euros) – for this variable we used imputed values provided for SHARE public use files for the cases of missing data. The variable *paid work* in the sample of retirees was coded as (0) for no paid

work and (1) did nevertheless some paid work. Finally, we created 10 dummy variables for country of residence (with Belgium as an arbitrary reference category).

Number of limitations in activities of daily living (ADL). This variable was operationalized as a sum of difficulties in the following everyday activities: dressing, including putting on shoes and socks, walking across a room, bathing or showering, eating, such as cutting up your food, getting in and out of bed, and using the toilet, including getting up or down.

Work stressors. We included three work-stressor indicators. Participants reported how much they agreed or disagreed with the statements "My job is physically demanding", "I am under constant time pressure due to a heavy workload." and "I have very little freedom to decide how I do my work." Originally, the responses to these three statements were coded into a 4-point Likert scale, ranging from 1 (strongly agree) to 4 (strongly disagree). Responses were recoded so that higher values represent higher *physical demands*, higher *time pressure* and less *job autonomy*.

Results

Descriptive Analyses

Descriptive statistics and bivariate correlations for both samples are presented in Tables 1 and 2. We examined possible differences between employees and retirees by means of MANCOVA, adjusting for differences among both groups in age, years of education, financial status, gender, marital status, country, and number of limitations in activities of daily living. After adjusting for these variables, no differences were observed between the two samples in any of the well-being indicators (depression at Time 1: $F(1, 4132) = 0.12$; $p = .73$; depression at Time 2: $F(1, 4132) = 2.22$; $p = .14$; quality of life at Time 1: $F(1, 4132) = 0.01$; $p = .94$; quality of life at Time 2: $F(1, 4132) = 2.75$; $p = .10$).

Please, Insert Table 1 about here

Please, Insert Table 2 about here

Test of Hypotheses

Hypothesis 1a states that volunteering, providing help, taking part in political or community organizations, attending educational courses, going to the sports/social clubs and taking part in religious organizations are negatively related to depression and positively related to quality of life whereas Hypothesis 1b predicts that caregiving for a disabled adult relates positively to depression and negatively to quality of life. Furthermore, we hypothesized that the negative associations between volunteering, providing help, taking part in political or community organizations, attending educational courses, going to the sports/social clubs and taking part in religious organizations and depression and low quality of life at follow up, respectively, will be stronger for individuals with a higher level of initial depression and a lower level of initial quality of life (Hypothesis 2a). We also predict that the positive relationship between caring for a disabled adult and depression and low quality of life over time will be stronger for individuals with a higher level of initial depression and a lower level of initial quality of life (Hypothesis 2b). We tested these hypotheses, controlling for demographic variables, and depression and quality of life at baseline separately for retirees and employees.

Table 3 displays the results for the retirees' sample. Analyses showed that volunteering negatively predicted depression, however, the increase in the explained variance was not significant. In contrast, going to sport clubs, engaging in voluntary work, and providing help to family or friends were positively related to quality of life. Overall, engaging in different activities did increase the proportion of explained variance in quality of life. Thus, for the retirees Hypothesis 1a was partially supported, whereas no support was found for the Hypothesis 1b.

Please, Insert Table 3 about here

Depression at Time 1 moderated the relationships between taking part in religious organization and depression at Time 2, and between caregiving and depression at Time 2. Slope analyses revealed that the effects were significant only at high levels of initial depression (taking part in religious organization: $t(2810) = -3.041$, $p < .01$; caregiving: $t(2810) = 1.960$, $p < .05$).

Please, Insert Figure 1 about here

Please, Insert Figure 2 about here

As can be seen in Figure 1, the highest depression levels at follow up were experienced by those retirees who did not take part in religious organization at the baseline and who suffered from higher initial depression levels. These results partially support Hypothesis 2a. Moreover, congruently with Hypothesis 2b, Figure 2 displays that the highest depression levels at follow up were reported by retirees who were caring for a disabled adult at the baseline and were suffering from higher initial levels of depression. We found no interaction effects for quality of life.

When analysing the employee sample, we controlled for work stressors, in addition to the other control variables. As can be seen in Table 4, a physically demanding job predicted a higher level of depression at Time 2, whereas experiencing time pressure predicted lower quality of life at Time 2. After controlling for these variables, we did not find any direct effects of engaging in activities at Time 1 on depression or quality of life at Time 2. Hence, Hypotheses 1a and 1b were not supported in the employee sample.

Please, Insert Table 4 about here

Similarly to the sample of retirees, we found significant interaction effects between initial well-being and activities for depression as outcome variable. The initial level of depression moderated the relationship between taking part in political or community organizations and caring for a disabled adult and the level of depression at follow up, respectively. Slope analyses revealed that the effects were significant only at high levels of initial depression (taking part in political organization: $t(1369) = -2.295$, $p < .05$; caregiving: $t(1369) = 2.701$, $p < .01$). Figure 3 shows that the highest depression at follow up was experienced by those employees who did not take part in political or wider community organizations at Time 1 and who suffered from higher initial levels of depression. These results partially confirmed Hypothesis 2a in older employees. Finally, providing support for Hypothesis 2b, the highest depression at the follow up was reported by employees who were caring for a disabled adult at Time 1 and were suffering from higher initial levels of depression (see Figure 4).

Please, Insert Figure 3 about here

Please, Insert Figure 4 about here

Supplementary analysis

We ran additional analysis in both sub-samples taking into account the amount of social activities (aggregating volunteering, providing help, attending educational course, going to a sport/social club, taking part in religious and political/ community organizations, respectively) and caregiving and their interaction effects with the well-being at baseline to address the assumption of depression theories that amount of positive activity is a critical feature in depressive symptomology.[1] We did not find any direct or interaction effects of the amount of social activities on depression or quality of life at follow up in older employees. Only the interaction between caregiving and initial level of depression was significant in this

[1] We are thankful to the anonymous reviewer for this suggestion.

sub-sample (b = .38; p <.01). In retirees, however, the amount of social activities positively predicted quality of life (b = .04; p <.05) and negatively predicted depression (b = -.10; p <.01) at follow up. There was also an interaction effect between the amount of social activities and initial levels of depression on depression at the follow up (b = -14; p <.01): in retirees with initially higher levels of depression, participation in more social activities was associated with a greater decrease in depression at follow-up than in those with initially lower levels of depression. The interaction effect between caregiving and initial depression on depression at the follow up was also significant (b = .30; p <.05) and showed the same pattern as in our main analysis.

Discussion

Successful aging and maintenance of good quality of life among the elderly are important concerns to our societies. The present study examined the joint role of different types of activities in depression and quality of life in old age over a period of two years. Our study provides partial support for the hypothesis that activities matter in elderly's well-being over time. For retirees, volunteering, providing help, and going to sports or social clubs improved their quality of life over time. In contrast, engaging in activities was not related to depression or quality of life in older employees at the follow up. Rather, we found that work stressors were related to older employees' psychological well-being over time.

Our findings confirm in one single study the results from past research that examined the role of these activities in separate studies (Biddle, 2000; Kloep & Hendry, 2006; McAuley et al., 2000; Taylor et al., 2004). Our study offers support for the beneficial effects of volunteering and providing help for quality of life in retirees. The altruistic nature of both activities is a significant source of social approval (Thoits & Hewitt, 2001), which could be argued to strengthen the perceptions of self-realization and pleasure as well as an individual's

sense of competence (Warr et al., 2004a). Our findings also confirm previous research in that engaging in leisure activities, such as going to sports or social clubs, enhances quality of life and may prevent age-related problems (McAuley et al., 2005; Rejeski & Mihalko, 2001). In light of conservation of resources theory (Hobfoll, 2001), it seems that retirees gain these important resources particularly through social activities which help them improve their well-being. Furthermore, based on previous work on perceived prosocial impact (Grant, 2007, Grant & Sonnentag, 2010) we could also argue that specifically the experience of helping others through volunteering and providing help enables retirees to improve their quality of life over time. Volunteering, providing help, and going to sports or social clubs were the three most prevalent activities in the retirees sub-sample and it could be that the rest of the activities did not have an effect on retirees' well-being because they did not engage in them enough. This argument was further supported by our supplementary results showing that all social activities combined did have a direct effect on depression and quality of life in retirees.

The present study also contributes to the understanding of how the initial levels of well-being condition the effects of engaging in activities on well-being at the follow up. In line with our expectations, retirees who suffered from more severe initial depression, but at the same time took part in religious organizations improved their depressive symptoms the most. Similarly, older employees who experienced higher initial depression and were taking part in political or community organizations experienced the most significant decrease in depression two years later. These findings indicate that engaging in activities such as socializing is most beneficial for individuals who are worse-off in the beginning (Barefoot et al., 2000). On the contrary, caring for a disabled adult worsens the depressive symptoms the most in those who had already been more depressed at the baseline. Thus, when designing interventions it is important to consider that particularly depressed individuals need more support or special attention when they come into a situation where they have to provide care. Interestingly, we

found differential effects of activities on quality of life compared to depression which supports our argument about the need to study both negative and positive aspects of well-being (Wiggins et al., 2008).

Importantly, our results support the assumption that activities do not play such a strong role in the promotion of well-being of older employees. First, our findings are in line with cross-sectional results of Warr et al. (2004a) who found that doing charity work was related to affective well-being in retirees, but not in older employees. Second, the present study shows that also providing help to family, friends or neighbours and going to sports or social clubs improve quality of life in retirees, but not in older employees. Both, providing help and volunteering are two types of productive albeit non-paid activities. Retirees might engage in them to compensate for work roles they had to abandon when they retired. Perhaps this is a reason why engaging in these two activities predicts their well-being and not that of the older employees whose main productive activity still remains within their jobs. Retirees and older employees also differed substantially in terms of age, educational level, and marital status which could reflect different cohorts and could explain some differences between both groups (e.g., religious activity).

Finally, there are several reasons why some activities did not have main and interactive effects on well-being. We observed high mean levels and low standard deviations of well-being at baseline and relatively low prevalence of some activities. Our findings also showed that the vast majority of variance in well-being indicators at follow up was explained by the well-being indicators and background factors at baseline and hence the amount of variance that could have been explained on top of this already explained variance was relatively small. Moreover, the lack of direct effects of engaging in activities in employees could also be explained with our findings highlighting work stress rather than active lifestyle as a main influence on employees' well-being over time. Our findings showed that physically

demanding jobs increase depression over time, extending previous cross-sectional findings on young and middle-aged adults (Wang & Patten, 2001). Time pressure as a psychological demand decreased the quality of life at the follow up. These findings suggest that the effects of physical demands are more pronounced in employees' physical health which could contribute to depression (Meltzer et al., 2012), whereas the effect of psychological demands such as time pressure do not necessarily translate into poor health and depressive symptomology (at least not within two years), but rather impact the evaluation of one's well-being, such as quality of life.

Limitations

The present study has a number of limitations, many related to the nature of the SHARE data we used. For instance, work stress indicators were operationalized with single items which is very common in large-scale surveys, but the reliability of these scales is open to question (Warr, 2008). Although single-item measures of occupational stressors have been used in previous studies with large secondary datasets (e.g., Debus, Probst, König, & Kleinmann, 2012; Wang, Zhan, Liu, & Schultz, 2008), future research should use more reliable measures of job demands and job autonomy that exist in work and organizational psychology. Next, engaging in each activity was limited to the past month and was recorded by single items in yes-no format. This type of measurement does not provide enough information as to what extent the engaging in activities was representative for the individuals over a longer period of time. Future studies might extend the present findings by assessing the effort or time spent in each activity. Moreover, depression was not measured with the same response format across waves. To address this problem, we recoded the Time 1 measurement in various ways and used the depression indicator that showed the highest correlation with depression index at Time 2.

Furthermore, we only selected those individuals who were either in employment or in retirement at both waves and did not have missing values. Hence, our sample cannot be considered to be representative of the European elderly population. Moreover, longitudinal SHARE data is collected every two years. This time interval is relatively large and could give space to different confounding variables. In addition, it could not effectively capture the shorter-term changes in well-being as a result of temporarily engaging in activities (George & Jones, 2000; Mitchell & James, 2001). Although past longitudinal research showed that well-being in old age changes over a two-year period (e.g., Hao, 2008) and we controlled for confounding effects of a wide array of variables, we encourage future research to use longitudinal designs with shorter time lags. Finally, only few significant interaction effects might well be random given a large number of interaction effects tested. While we cannot firmly exclude this possibility, we have to note that we detected these effects after controlling for a wide range of demographic variables. Hence, these effects could indeed be meaningful and we believe they should not be disregarded given the significant implications they might have for improving depression in old age.

Implications

Our findings have implications for both practice and future research. Active lifestyle in terms of some activities was found to improve well-being, especially in those who were the most vulnerable at baseline. Therefore, intervention programs and preventive measures should stimulate engagement in community and leisure activities, such as attending religious activities and other community based activities, to achieve successful aging (Lampinen et al., 2006). Because there are country effects on the well-being indicators, intervention programs should take country-specific context factors into account. However, the design of efficient measures and programs should also consider what motivates older adults to engage in different activities. Future studies could analyse what reasons drive older adults towards

engagement in certain activities and not in others. Also the meaningfulness of each activity for every participant could be assessed to see if some activities are psychologically more important than others (Warr et al., 2004a; Zacher et al., 2012). Overall, this information could help understand the mechanisms behind the associations of activities with well-being. Such analysis might also provide further explanations about why some activities relate only to some aspects of well-being and not to others. Finally, future research could extend Zacher et al.'s (2012) study in examining contextual and personal factors that might condition the effects of activities on well-being. For instance, it would be interesting to explore further the conditions under which caregiving does not deteriorate well-being and under which (if any) social activities do not enhance it. Thereby, future research can make an important contribution to fostering well-being in older employees and retirees.

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Table 1

Descriptive statistics of the studied variables

Variable	Categories	Prevalence-retirees	Prevalence-employees	*M*-employees	*M*-retirees	*SD*-employees	*SD*-retirees
Marital status	Single	28.1	19.3				
	Living with a spouse	71.9	80.7				
Gender	Male	56.1	54.9				
	Female	43.9	45.1				
Country	Austria	11.9	6.0				
	Germany	8.6	8.5				
	Sweden	12.7	17.1				
	Netherlands	6.3	10.3				
	Spain	5.6	5.0				
	Italy	10	4.5				
	France	7.3	5.7				
	Denmark	7.1	9.1				
	Greece	10.9	13.8				
	Switzerland	3.4	6.5				
	Belgium	16.1	13.6				
Activities	Voluntary work	14.8	13.0				
	Caregiving for a sick/ disabled adult	6.6	7.9				
	Providing help	23.1	34.7				
	Attending educational course	4.6	15.9				
	Going to a sport club	18.8	26.7				
	Religious organization	14.0	9.0				
	Political/community organization	4.6	6.5				

Table 1. Cont.

Variable	Categories	Prevalence-retirees	Prevalence-employees	*M*-employees	*M*-retirees	*SD*-employees	*SD*-retirees
Nº of limitations ADL				.02	.16	.15	.59
Age				55.01	69.79	3.84	7.61
Financial status				21493.25	20000.83	88908.13	57835.26
Education				12.28	9.92	3.61	4.43
Depression T1				1.63	1.77	.45	.51
Depression T2				.95	1.50	1.56	1.99
Quality of life T1				3.26	3.10	.42	.51
Quality of life T2				3.28	3.09	.41	.52
Physical demands				2.48	-	1.02	-
Time pressure				2.70	-	.89	-
Lack of job autonomy				2.01	-	.91	-

Table 2

Intercorrelations among the studied variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Nº of limitations ADL	-	.10**	-.08**	-.03	-.02	-.11**	.02	.01	-.01	-.03	.03	.00	.00	-.01
2. Age	.05	-	-.22**	.01	.00	-.16**	-.10**	-.01	.07**	.04*	.04*	-.10**	-.01	.06**
3. Marital status[1]	-.02	-.04	-	/	.05*	.08**	/	/	/	/	/	/	/	/
4. Gender[2]	-.02	.05	/	-	.12**	.06**	/	/	/	/	/	/	/	/
5. Financial status	-.02	.03	.03	.10**	-	.12**	-.04*	-.02	-.05*	.00	.04	-.07**	-.03	.02
6. Education	-.06*	-.07*	-.01	-.07**	.08**	-	.14**	.26**	-.01	.09**	-.27**	-.22**	-.08**	.13**
7. Austria	.01	-.08**	/	/	-.02	.03	-	/	/	/	/	/	/	/
8. Germany	-.04	-.02	/	/	-.01	.20**	/	-	/	/	/	/	/	/
9. Sweden	-.01	.15**	/	/	-.06*	-.08**	/	/	-	/	/	/	/	/
10. Netherlands	.00	-.01	/	/	.00	.02	/	/	/	-	/	/	/	/
11. Spain	-.01	-.04	/	/	-.01	-.23**	/	/	/	/	-	/	/	/
12. Italy	.06*	.02	/	/	-.02	-.10**	/	/	/	/	/	-	/	/
13. France	-.01	-.10**	/	/	-.01	-.07**	/	/	/	/	/	/	-	/
14. Denmark	.01	-.04	/	/	.08**	.17**	/	/	/	/	/	/	/	-
15. Greece	-.03	.04	/	/	-.04	-.11**	/	/	/	/	/	/	/	/
16. Switzerland	-.02	.09**	/	/	.09**	.15**	/	/	/	/	/	/	/	/
17. Voluntary work[4]	.02	.02	/	/	.06*	.08**	/	/	/	/	/	/	/	/
18. Caregiving for sick adult[4]	-.02	.03	/	/	.00	.04	/	/	/	/	/	/	/	/
19. Providing help[4]	.02	-.07**	/	/	.04	.05	/	/	/	/	/	/	/	/
20. Attending edu. course[4]	-.02	-.03	/	/	.09**	.18**	/	/	/	/	/	/	/	/
21. Going to a sport club[4]	-.03	-.03	/	/	.00	.14**	/	/	/	/	/	/	/	/
22. Religious org. [4]	.04	.01	/	/	.07**	.02	/	/	/	/	/	/	/	/
23. Political/comm. org. [4]	.00	.00	/	/	.04	.12**	/	/	/	/	/	/	/	/
24. Depression T1	.11**	-.04	-.16**	-.10**	-.01	-.11**	.05	.07*	-.08**	-.07*	.00	.11**	-.01	-.16**
25. Depression T2	.10**	-.02	-.10**	-.14**	-.05	-.06*	.05*	.05*	-.04	-.01	-.02	.14**	-.01	-.07**
26. Quality of life T1	-.11**	.06*	.09**	-.02	.07**	.19**	.03	.05	.10**	.11**	-.02	-.11**	-.07*	.10**
27. Quality of life T2	-.10**	.01	.08**	.00	.05	.17**	.01	.06*	.06*	.08**	-.04	-.17**	-.02	.11**
30. Physically demands	.06*	.02	.05	.06*	-.03	-.28**	.08**	-.04	-.02	-.06*	-.01	.11**	-.04	-.02
29. Time pressure	-.01	-.03	.03	.04	.01	.05	.07**	.11**	-.01	-.15**	-.07**	.06*	-.07**	.05
30. Lack of job autonomy	.00	-.02	-.01	.00	-.05	-.19**	.09**	-.04	-.08**	-.07*	.07**	-.01	-.02	-.05

Note: Results on the employees' sample below the diagonal. [1] living with a partner/spouse=1; [2] male =1; [3]employee=1; [4]engaging in activities=1; *$p < .05$; **$p < .01$

Table 2

Continued

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1. Nº of limitations ADL	-.01	.00	-.05**	-.04*	-.06**	.01	-.07**	-.06**	-.02	.24**	.22**	-.26**	-.23**	/	/
2. Age	-.02	.08**	-.08**	-.08**	-.16**	-.07**	-.06**	-.02	-.02	.08**	.14**	-.11**	-.16**	/	/
3. Marital status[1]	/	/	/	/	/	/	/	/	/	-.18**	-.18**	.04*	.12**	/	/
4. Gender[2]	/	/	/	/	/	/	/	/	/	-.18**	-.19**	.06*	.07**	/	/
5. Financial status	-.08**	.20**	.05**	.00	.03	.04*	.05**	-.03	.02	-.07**	-.07**	.09**	.11**	/	/
6. Education	-.19**	.09**	.18**	.09**	.10**	.15**	.17**	-.03	.12**	-.22**	-.19**	.33**	.32**	/	/
7. Austria	/	/	/	/	/	/	/	/	/	.02	.02	.10**	.05**	/	/
8. Germany	/	/	/	/	/	/	/	/	/	.01	.04	.06**	.07**	/	/
9. Sweden	/	/	/	/	/	/	/	/	/	-.06**	-.03	.08**	.06**	/	/
10. Netherlands	/	/	/	/	/	/	/	/	/	-.05**	-.06**	.09**	.12**	/	/
11. Spain	/	/	/	/	/	/	/	/	/	.01	.01	-.04*	-.06**	/	/
12. Italy	/	/	/	/	/	/	/	/	/	.12**	.13**	-.20**	-.19**	/	/
13. France	/	/	/	/	/	/	/	/	/	.04	.01	-.08**	-.04	/	/
14. Denmark	/	/	/	/	/	/	/	/	/	-.14**	-.07**	.12**	.16**	/	/
15. Greece	-	/	/	/	/	/	/	/	/	.13**	.01	-.24**	-.25**	/	/
16. Switzerland	/	-	/	/	/	/	/	/	/	-.07**	-.05**	.09**	.11**	/	/
17. Voluntary work[4]	/	/	-	/	/	/	/	/	/	-.13**	-.11**	.16**	.17**	/	/
18. Caregiving for sick adult[4]	/	/	/	-	/	/	/	/	/	-.01	-.02	.04	.05**	/	/
19. Providing help[4]	/	/	/	/	-	/	/	/	/	-.09**	-.09**	.10**	.14**	/	/
20. Attending edu. course[4]	/	/	/	/	/	-	/	/	/	-.07**	-.05*	.09**	.09**	/	/
21. Going to a sport club[4]	/	/	/	/	/	/	-	/	/	-.12**	-.12**	.16**	.18**	/	/
22. Religious org. [4]	/	/	/	/	/	/	/	-	/	.00	-.04*	.02	-.02	/	/
23. Political/comm. org. [4]	/	/	/	/	/	/	/	/	-	-.08**	-.04*	.08**	.07**	/	/
24. Depression T1	.15**	-.06*	-.01	.00	.02	-.05	-.12**	-.02	-.06*	-	.46**	-.66**	-.46**	/	/
25. Depression T2	-.09**	.00	.00	.03	.01	.01	-.03	-.05	-.04	.36**	-	-.39**	-.58**	/	/
26. Quality of life T1	-.28**	.11**	.08**	.04	.03	.11**	.14**	.02	.09**	-.64**	-.25**	-	.58**	/	/
27. Quality of life T2	-.18**	.12**	.05*	.05	.02	.07*	.09**	.02	.05*	-.36**	-.41**	.50**	-	/	/
30. Physical demands	.09**	-.10**	-.05	-.02	-.03	-.07**	-.09**	.06*	.00	.09**	.12**	-.12**	-.10**	-	/
29. Time pressure	.07**	-.01	-.04	-.02	.04	.03	.00	.02	.05	.12**	.08**	-.09**	-.11**	.29**	-
30. Lack of job autonomy	.09**	-.03	-.08**	-.03	-.07*	-.04	-.08**	.04	-.02	.10**	.06*	-.16**	-.12**	.17**	.19**

Note: Results on the employees' sample below the diagonal. [1] living with a partner/spouse=1; [2] male =1; [3]employee=1; [4]engaging in activities=1; *$p < .05$; **$p < .01$

Table 3

Hierarchical regression analysis of depression and quality of life at Time 2 on engaging in seven types of activities at Time 1 and their interaction with initial level of depression and quality of life in retirees' sample.

		Depression T2				Quality of life T2			
Step	Variable	b	95% CI for b	R^2	ΔR^2	b	95% CI for b	R^2	ΔR^2
1	Well-being variable T1	.75**	.68; .82	.27	.27**	.23**	.21; .25	.410	.410**
	Nº of limitations ADL	.21**	.14; .28			-.05**	-.06; -.03		
	Age	.18**	.11; .25			-.06**	-.07; -.04		
	Marital status[1]	-.22*	-.38; -.07			.08**	.05; .12		
	Gender[2]	-.40**	-.54; -.26			.02	-.01; .06		
	Financial status	-.02	-.09; .04			.02*	.00; .03		
	Education	-.13**	-.21;-.05			.03**	.01; .05		
	Paid work	.05	-.26; .36			.01	-.07; .08		
	Austria	.12	-.12; .37			-.01	-.06; .05		
	Germany	.39*	.11; .66			.04	-.02; .11		
	Sweden	-.03	-.27; .21			.04	-.01; .10		
	The Netherlands	-.11	-.41; .18			.14**	.07; .22		
	Spain	.06	-.26; .39			-.07	-.15; .00		
	Italy	.54**	.27;.81			-.18**	-.24; -.12		
	France	.00	-.29; .28			.00	-.07; .07		
	Denmark	-.15	-.44; .14			.21**	.14; .28		
	Greece	-.22	-.48; .04			-.21**	-.27; -.15		
	Switzerland	-.21	.30; -.60			.17**	.07; .26		
2	Volunteering	-.19*	-.38; .00	.27	.00	.05*	.01; .10	.414	.004*
	Caregiving for sick adult	.02	-.24; .29			.00	-.07; .06		
	Providing help	-.06	-.22; .10			.05*	.01; .09		
	Attending educational course	.07	-.25; -.39			.03	-.04; .11		
	Going to a sport/social club	-.14	-.31; .03			.04*	.00; .08		
	Religious organization	-.16	-.36; .04			.00	-.05; .05		
	Political/community organization	.18	-.14; .50			.01	-.06; .09		
3	Well-being variable T1xVolunteering	-.08	-.30; .15	.28	.01*	-.06*	-.12; -.01	.416	.002
	Well-being variable T1xCaregiving	.31*	.02; .60			.04	-.03; .11		
	Well-being variable T1xProviding help	-.03	-.20; .14			-.01	-.05; .03		
	Well-being variable T1xAttending educational course	-.33	-.70; .04			.02	-.07; .12		
	Well-being variable T1xGoing to sport/social club	-.12	-.32; .07			-.01	-.05; .04		
	Well-being variable T1xReligious organization	-.26*	-.45; -.07			-.01	-.06; .04		
	Well-being variable T1xPolitical/community organization	-.14	-.59; .30			-.01	-.09; .08		

Notes: *$p < .05$; **$p < .01$

Table 4

Hierarchical regression analysis of depression and quality of life at Time 2 on engaging in seven types of activities at Time 1 and their interaction with initial level of depression and quality of life in employees' sample

		Depression T2				Quality of life T2			
Step	Predictor	b	95% CI for b	R^2	ΔR^2	b	95% CI for b	R^2	ΔR^2
	Well-being variable T1	.51**	.43; .60	.17	.17**	.18**	.16; .20	.28	.28**
1	Nº of limitations ADL	.07	-.01; .15			-.02	-.04; .00		
	Age	-.01	-.08; .07			-.01	-.03; .01		
	Marital status[1]	-.16	-.36; .04			.03	-.02; .07		
	Gender[2]	-.24**	-.40; -.08			.02	-.02; .06		
	Financial status	-.06	-.13; .02			.00	-.02; .02		
	Education	-.08	-.16; .01			.01	-.01; .03		
	Austria	.03	-.34; .41			.04	-.05; .13		
	Germany	.02	-.32; .36			.08*	.00; .17		
	Sweden	-.25	-.53; .03			.06	-.01; .13		
	Netherlands	-.15	-.46; .17			.07	-.01; .15		
	Spain	-.42*	-.83; -.02			-.01	-.11; .08		
	Italy	.46*	.05; .88			-.18**	-.28; -.08		
	France	-.33	-.71; .06			.06	-.03; .15		
	Denmark	-.25	-.58; .08			.12	.04; .20		
	Greece	-.71**	-1.00; -.41			-.02	-.09; .05		
	Switzerland	-.01	-.40; .34			.15**	.06; .24		
2	Physically demanding job	.11*	.03; .20	.18	.01*	.01	-.02; .02	.29	.01*
	Time pressure	.04	-.05; .12			-.03**	-.05; -.01		
	Job autonomy	.02	-.06; .10			-.01	-.03; .01		
3	Volunteering	.04	-.20; .28	.18	.00	-.01	-.07; .05	.29	.00
	Caregiving for sick adult	.17	-.12; .46			.03	-.04; .10		
	Providing help	-.05	-.22; .12			-.01	-.05; .03		
	Attending educational course	.10	-.12; .32			-.02	-.07; .04		
	Going to a sport/social club	-.01	-.19; .17			-.01	-.05; .04		
	Religious organization	-.19	-.47; .09			.02	-.05; .09		
	Political/community organization	-.10	-.42; .22			.02	-.06; .09		
4	Well-being variable T1xVolunteering	.20	-.07; .47	.19	.01*	.06	.00; .13	.29	.00
	Well-being variable T1xCaregiving	.37**	.09; .65			.02	-.05; .10		
	Well-being variable T1xProviding help	-.01	-.18; .15			.01	-.03; .05		
	Well-being variable T1xAttending educational course	-.03	-.28; .23			-.01	-.07; .06		
	Well-being variable T1xGoing to sport/social club	.07	-.12; .27			.05*	.00; .09		
	Well-being variable T1xReligious organization	-.25	-.56; .07			-.04	-.11; .03		
	Well-being variable T1x Political/community organization	-.48*	-.88; -.08			-.05	-.14; .05		

Note: *$p < .05$; **$p < .01$

Figure Captions

Figure 1. Moderating effect of the initial level of depression in the relationship between taking part in religious organization and the level of depression after two years in retirees.

Figure 2. Moderating effect of the initial level of depression in the relationship between caregiving for sick adult and the level of depression after two years in retirees.

Figure 3. Moderating effect of the initial level of depression in the relationship between taking part in political organization and the level of depression after two years in employees.

Figure 4. Moderating effect of the initial level of depression in the relationship between caregiving for sick adult and the level of depression after two years in employees.

Figure 1

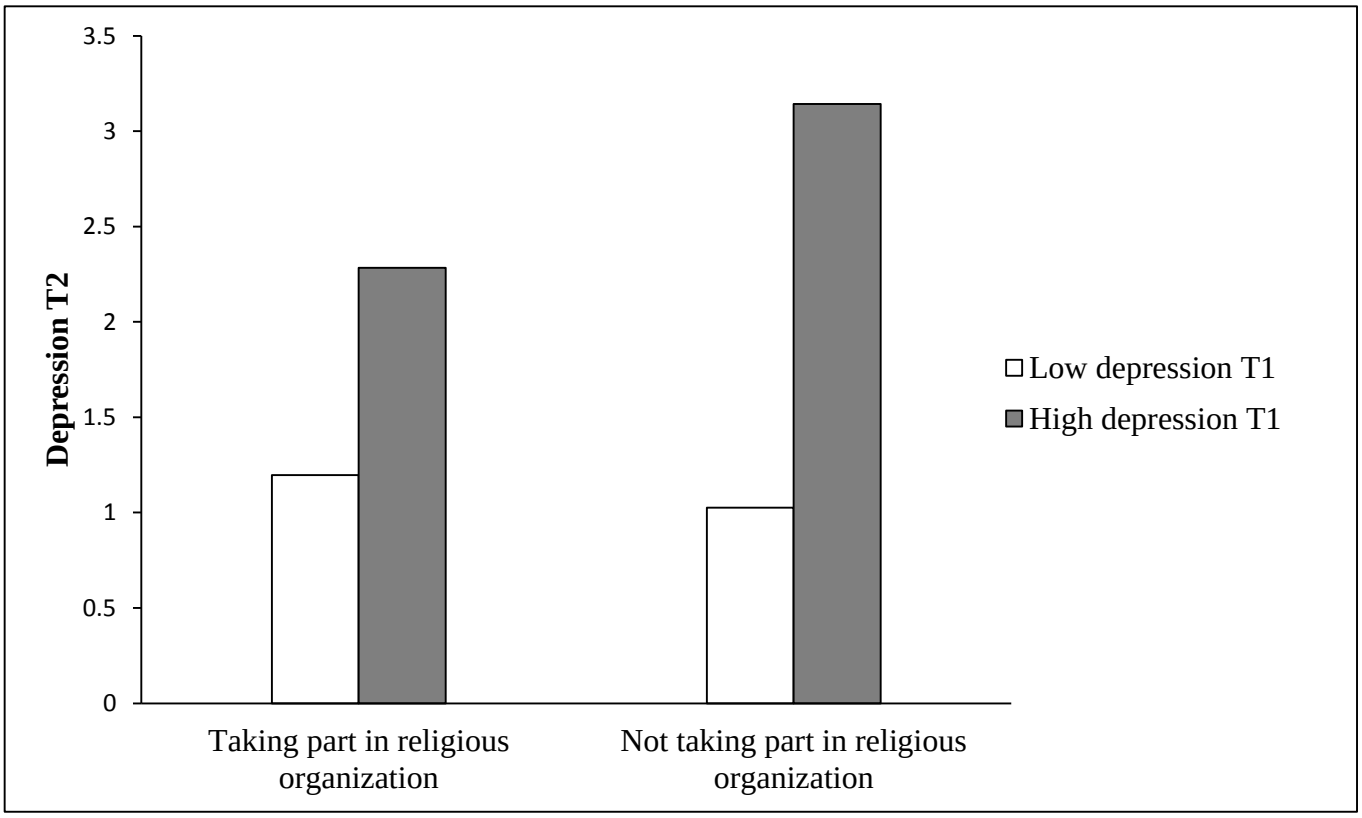

3.5
3
2.5
2
1.5
1
0.5
0
Depression T2
Taking part in religious organization
Not taking part in religious organization
Low depression T1
High depression T1

Figure 2

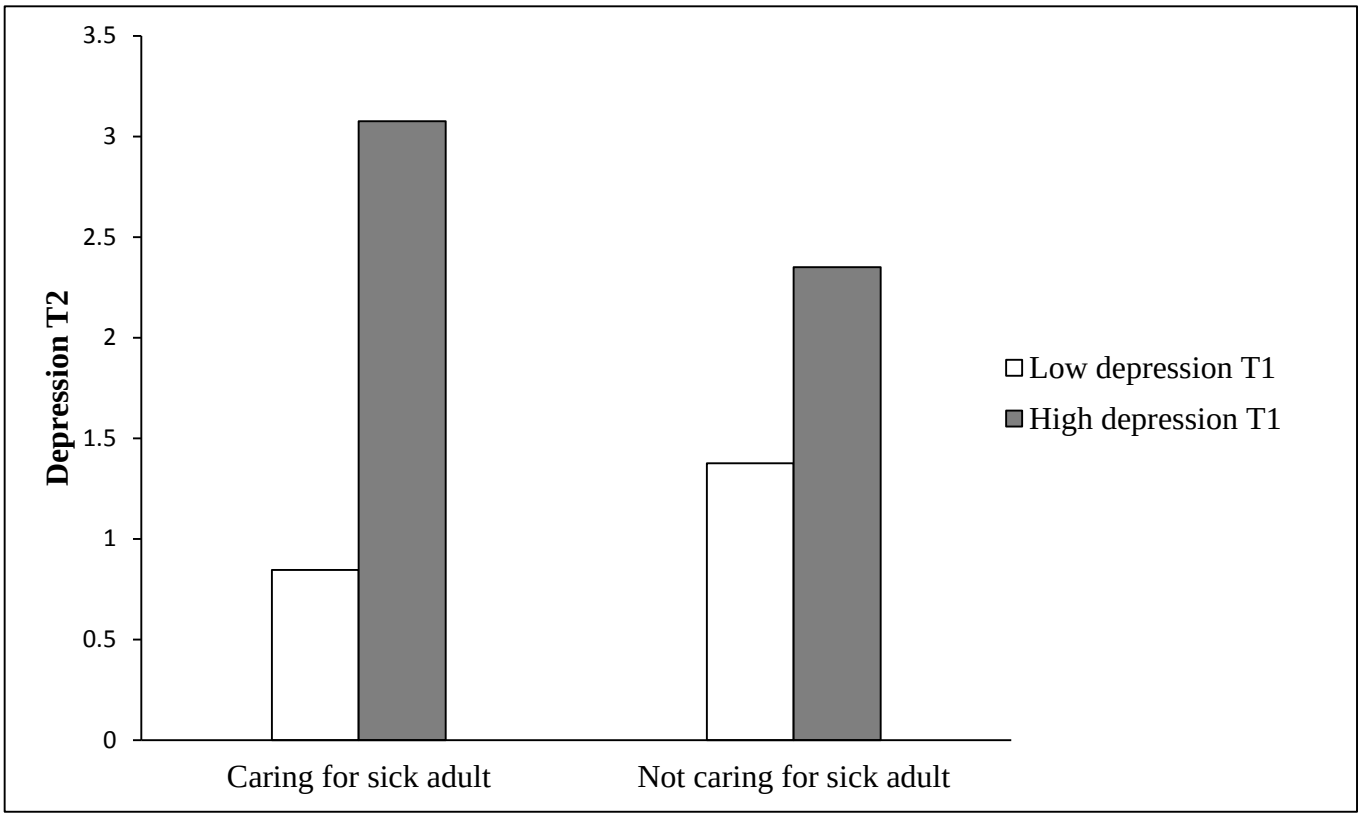

3.5
3
2.5
2
1.5
1
0.5
0
Depression T2
Low depression T1
High depression T1
Caring for sick adult
Not caring for sick adult

Figure 3

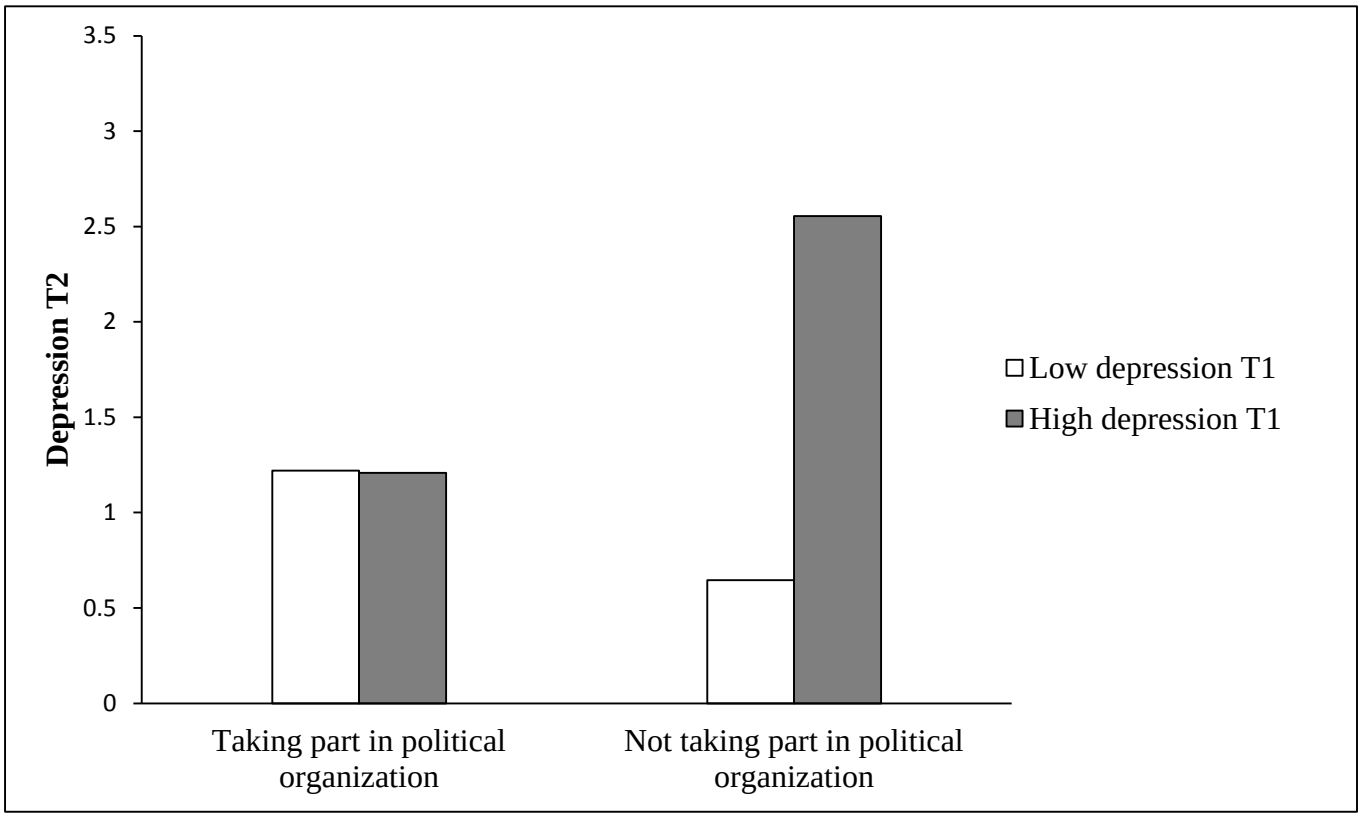
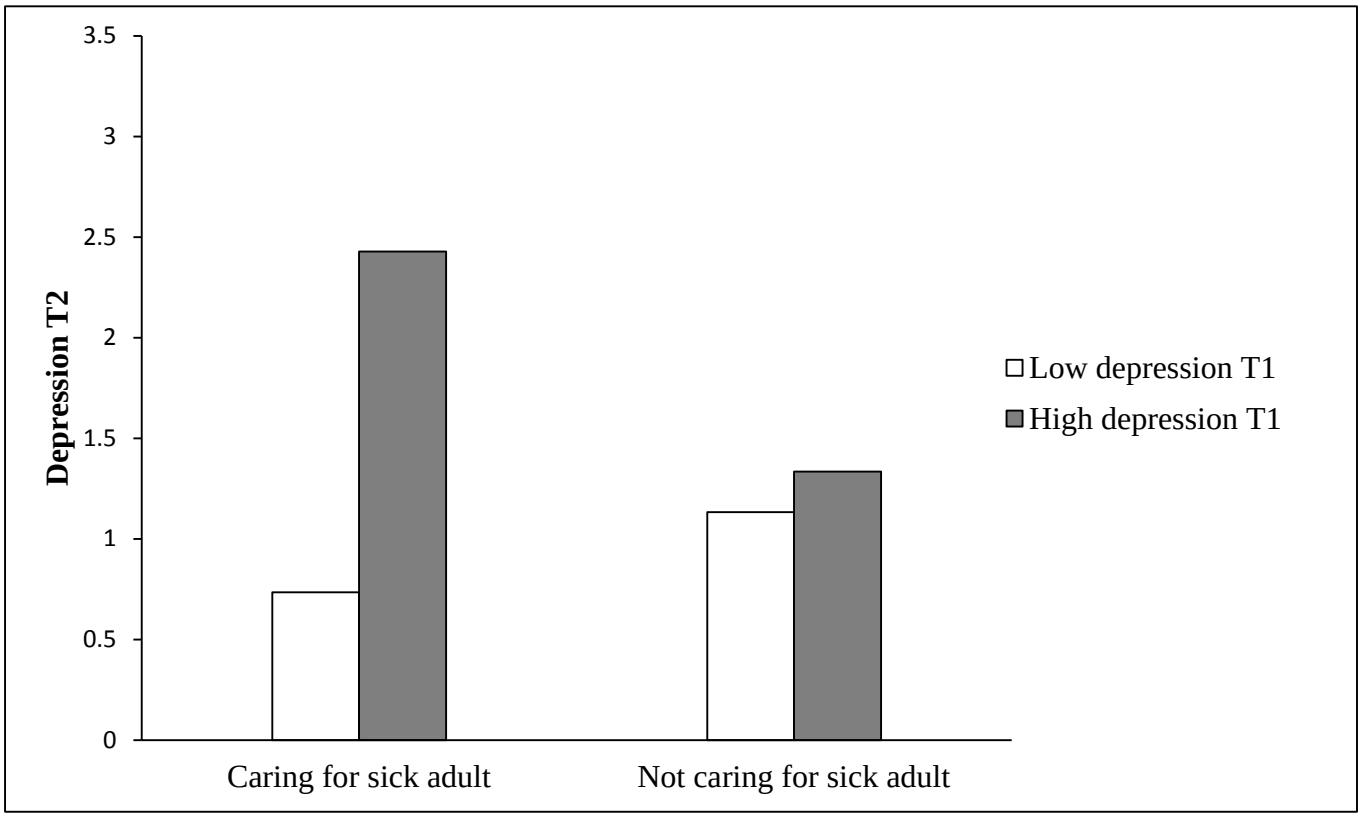

3.5
3
2.5
2
1.5
1
0.5
0
Depression T2
Taking part in political organization
Not taking part in political organization
Low depression T1
High depression T1

Figure 4


3.5
3
2.5
2
1.5
1
0.5
0
Depression T2
Low depression T1
High depression T1
Caring for sick adult
Not caring for sick adult